
Component power consumption

Before you can calculate the total power consumption of your Meridian 1 configuration, you must have consumption figures for each component within the system.

The power consumption of intelligent peripheral equipment (IPE) and peripheral equipment (PE) circuit cards is given in [Tables 17](#) and [18](#). Because electrical load varies depending on traffic load, some assumptions are made when presenting these figures: 25% of maximum capacity (9 CCS) for digital and analog lines, and 75% of maximum capacity (30 CCS) for trunks. These figures also take into account the average efficiency of the module power supplies.

Table 17
Power consumption—IPE cards

Circuit card	Typical power (watts)
NT5K02 Flexible Analog Line card	20
NT5K17 Direct Dialing Inward Card	29
NT5K17 Direct Dialing Inward Card	29
NT5K19 DC5/AC15/RAN/Paging Trunk Card	29
NT1P62 Fibre Controller Card	26
NT7R52 Remote Carrier Interface	26
NT8D01AC Controller Card-4	26
NT8D01BC Controller Card-4 (SMT)	26
NT8D01AD Controller Card-2	26
NT8D02 Digital Line Card	20
NT8D03 Analog Line Card	16
NT8D09 Analog Message Waiting Line Card	16
NT8D14 Universal Trunk Card	28
NT8D15 E&M Trunk Card	26
NT8D16 Digitone Receiver Card	6

Table 18
Power consumption—PE cards

Circuit card	Typical power (watts)
QPC71 E&M/DX Signaling and Paging Trunk Card	2.5
QPC192 Off-Premises Extension Line Card	12.0
QPC250 Release Line Trunk Card	2.5
QPC297 Attendant Console Monitor Card	7.1
QPC422 Tone Detector Card	10.9
QPC430 Asynchronous Interface Line Card	14.8
QPC432 4-Port Data Line Card	10.2
QPC449 Loop Signaling Trunk Card	15.6
QPC450 CO/FX/WATS Trunk Card	7.0
QPC578 Integrated Services Digital Line Card	24.6
QPC594 16-Port 500/2500 Line Card	32.8
QPC659 Dual Loop Peripheral Buffer Card	40.4
QPC723 RS-232 4-Port Interface Line Card	14.8
QPC789 16-Port 500/2500 (Message Waiting) Line Card	26.4

[Table 19](#) shows power consumption data for each fully configured module. Use this data for rectifier and reserve power (battery) calculation.

Table 19
Meridian 1 module power consumption

Module	Power consumption (watts)
NT5D21 Core/Network Module	260
NT5K11 Enhanced Existing Peripheral Equipment (EEPE) Module	375
NT6D39 CPU/Network Module	360
NT6D44 Meridian Mail Module	240
NT6D60 Core Module	260
NT8D11 CE/PE Module	500
NT8D13 PE Module	240
NT8D34 CPU Module	260
NT8D35 Network Module	240
NT8D36 InterGroup Module	0
NT8D37 IPE Module	460
NT8D47 RPE Module:	
— local site	175
— remote site	100
NT9D11 Core/Network Module	260
Application Equipment Module	
— single	210
— dual	420
Pedestal (with blower unit)	50

System power is calculated by adding the power consumption (in watts) of all equipped modules.

BTU (thermal load) = total power dissipation x 3.41

For air conditioning purposes, 1 ton = 1200 BTU.

Power calculation guidelines

The method for calculating Meridian 1 system power is based on the number of modules and columns in the system, regardless of how many cards are initially equipped. The method ensures that the external power supply provides adequate capacity, under all conditions and all possible growth scenarios, for the modules installed.

Using a system power consumption worksheet ([Figure 27](#)), enter the quantity of each type of module, multiply by the power consumption per module, and then sum the individual module totals to obtain the total real power consumed by the system.

To calculate the current drain, divide the total real power consumption by the nominal input voltage. This gives the system current drain, or load in amperes. The worksheet shows nominal voltages of 208 (AC) input and 52 (DC) output. To calculate current drain for voltages other than those given in the worksheet, divide the total real power consumption by the desired voltage (such as 240 V AC or 54 V DC).

For calculations normally done for complex or apparent power (such as AC wire and panel size or the UPS rating for AC reserve power), divide the total real power in watts by the system power factor (typically 0.6) to obtain the complex power in volt-amperes (see [Figure 27](#)).

If you are upgrading an installed system, you can determine the total power consumption of the installed system in several ways. Two methods are listed below (the first method is more accurate than the second):

- Measure current drain for the complete installation under actual operating conditions over at least a two-week period. Determine peak current drain from these measurements.
- Measure idle (or near idle) current drain for the complete installation. Estimate peak current drain by multiplying the number of idle amperes by 1.5.

When you add or upgrade equipment, use either of these methods to determine existing current drain/power consumption. Use the guidelines in this document to determine the added power consumption.

The existing power plant may have to be replaced or its capacity may have to be increased to accommodate added equipment. Be sure to provide sufficient capacity to accommodate future growth.

Figure 27
Worksheet A—System power consumption worksheet

SYSTEM POWER CONSUMPTION WORKSHEET					
Module	Quantity		Module power consumption		Total module power consumption
NT6D39	_____	X	360	=	_____
NT6D44	_____	X	240	=	_____
NT6D60	_____	X	260	=	_____
NT8D11	_____	X	500	=	_____
NT8D13	_____	X	240	=	_____
NT8D34	_____	X	260	=	_____
NT8D35	_____	X	240	=	_____
NT8D37	_____	X	340	=	_____
NT8D47	_____	X	175	=	_____
Pedestals	_____	X	50	=	_____
Total real power (watts)				=	_____
Current drain:					
AC system:					
_____		(total real power)		=	_____ amperes, AC
_____		(nominal AC voltage) 208			
DC system:					
_____		(total real power)		=	_____ amperes, DC
_____		(nominal AC voltage) 52			
Complex (or apparent power) (AC only):					
_____		(total real power)		=	_____ volt-amperes (VA)
_____		(power factor) 0.6			

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Meridian 1 upgrades

Both AC- and DC-powered Meridian 1 upgrade packages are available, although most of the module-level upgrades will be DC. However, the following suggestions are offered:

- Consider an AC Meridian 1 upgrade if the existing Meridian SL-1 system is not using reserve power. If reserve power is later desired, one or more UPS units can be added. In addition, smaller SL-1 systems upgrading to Option 21 are often the most cost-effective and the easiest to install with an AC Meridian 1 upgrade.
- If the existing system already has battery backup, or if there is an existing DC power plant or excess rectifier capacity, a DC Meridian 1 upgrade package is usually chosen. For DC upgrades, there are several approaches to system powering:
 - Internal rectifiers that power the existing SL-1 equipment may, in some cases, be connected in parallel to new external rectifiers in order to share a common battery string. The QBL15 Power Distribution Unit is typically used as an interface between the different power equipment.
 - An existing external DC power plant, such as the QCA13, may be used as is, or expanded if necessary, to power both the existing equipment and the new Meridian 1 equipment.
 - A new external DC power plant, such as the NT6D82, the MFA150, or the 600/48 may be purchased and installed to power both the existing and new equipment.

Note: For all DC upgrades, carefully measure or calculate the system load of all equipment to make sure that the chosen power system will have enough capacity.

Consider each upgrade case individually, taking into account the existing equipment, space available at the site, and customer preferences.

Powering upgraded systems from existing rectifiers

Upgrades are available in shelf, cabinet, and module configurations. A shelf upgrade uses the power supplied by the cabinet into which it is installed. Cabinet and module upgrades where some or all of the existing cabinetry is retained can be complex. The addition of one or more modules to the existing system requires careful planning.

In systems where rectifiers are mounted in the equipment cabinets, one or more rectifiers may be added to a rectifier rack to expand the existing power capacity of the system. In centralized power systems in a power cabinet or bay, rectifiers and additional power cabinets or bays may be added as required. If batteries are part of the upgraded system or a centralized power scheme is to be used, rectifier compatibility must be considered. This is due to the fact that rectifiers are connected in parallel through connections made at the QBL15 Battery Distribution Box and centralized power systems; the output voltages of the rectifiers must be balanced for proper load sharing across the entire system.

For detailed information on Meridian 1 upgrades, refer to the *System and software upgrade guide*.

Use [Table 20](#) to determine rectifier compatibility for the rectifier types making up the upgraded or expanded system. In the table matrix, “Yes” indicates which rectifier combinations are compatible for load sharing.

Table 20
Rectifier compatibility (Part 1 of 2)

Rectifier type and output current	QRF4	QRF8D (min vintage)	QRF9	QRF12	NT6D52AA	NT0R71	NT0R72	NT5C03 (QCA13)	J2357 (QCA13)	J2427	A03544950 (NT6D82)	NT5C06 (MFA150)	NT5C07 (600/48)
Amps	25	40	20	30	30	25	25	50	50	25	100	25	50
QSD4	Yes												
QRF8D (min. vint.)		Yes		Yes		Yes							
QRF9			Yes										
QRF12		Yes		Yes		Yes							
NT6D52AA							Yes						
NT0R71		Yes		Yes		Yes							
NT0R72		Yes			Yes		Yes						

Table 20
Rectifier compatibility (Part 2 of 2)

Rectifier type and output current	QRF4	QRF8D (min vintage)	QRF9	QRF12	NT6D52AA	NT0R71	NT0R72	NT5C03 (QCA13)	J2357 (QCA13)	J2427	A03544950 (NT6D82)	NT5C06 (MFA150)	NT5C07 (600/48)
Amps	25	40	20	30	30	25	25	50	50	25	100	25	50
NT5C03 (QCA13)								Yes	Yes				Yes
J2357 (QCA13)								Yes	Yes				Yes
J2427										Yes			
A0344950 (NT6D82)											Yes		
NT5C06 (MFA150)												Yes	
NT5C07 (600/48)								Yes	Yes				Yes
Note: Load sharing is possible among rectifiers in the QCA13 cabinet if an upgraded List 3 control card is used as follows: — Use the P0677283 control card when only NT5C03 (SMR) rectifiers are installed. — Use the P0562926 control card when both J2357 and NT5C03 rectifiers are installed.													